

Claims 1-11 were rejected under 35 USC 103(a) as being unpatentable over Argo et al. '978 in view of Maxwell '921 wherein the Examiner asserts that Argo discloses a transmitter, comprising a multi-signal generator for providing a plurality of signals within a selected frequency band and having a center frequency and a relative frequency spacing of said simultaneous plurality of signals provided by AM and FM band comb frequency generators, wherein divide means 100, mixer 200 and the multiplied by 9 in 430 [sic] for providing the frequency spacing. The Examiner asserts that Argo discloses a modulator connected to said multi-signal generator for selectively and simultaneously modulating said plurality of signals, i.e., the varactor modulator 390 and the AM modulator 260. The Examiner further argues that Maxwell teaches the center frequency is selectively adjusted to cover at least a portion of the selected frequency band (by DDS 112 and step 304), and teaches a control unit for controlling at least one of the multi-signal generator center frequency and relative frequency spacing by controller 44 at terminal 54, ad where the DDS 112' receives the controlling signal 120 from the control block 118. Moreover, the Examiner concludes that it is obvious to one of ordinary skill in the art at the time of invention to modify Argo to include Maxwell's selectively controlling the center frequency and frequency spacing, and that by so doing, Argo's system would flexibly change the center frequency and frequency spacing.

Applicant first notes that the Examiner has not specified how or where to splice the portions of Maxwell into Argo to "include

Maxwell...[into] Argo's system" to form the basis of the rejection under 35 USC 103(a).

Applicant's examination of Argo provides a somewhat different structure. Applicant notes that on both the AM and FM generators, linear mixers 200, 400 respectively, are used and receive likely substantially pure sine wave modulation signals via the respective band pass filters 160, 440 to modulate the respective fixed AM and FM carriers.

As is well known, when linear mixers receive two input signals, e.g. A and B, by definition provide four, and only four output signals, A, B, A+B and A-B. If we define the RF carrier to be A and the modulating signal to be B, where $B \ll A$, we are left with only the carrier A (e.g. 1000 KHz) and the two sidebands, A-B and A+B (e.g. 990 KHz and 1010 KHz) and if the amplitude of A and B are proper only A+B and A-B, not a comb of signals covering an entire AM or FM band. Note Argo's own use of the linear mixer 260 as the audio modulator. Therefore, Argo is inoperative, or insufficiently or confusingly disclosed.

Alternately, if a band-wide comb of signals were somehow generated via a linear mixer from filtered (sine wave) signals, there is no teaching on the limitation of the extreme high and low frequencies of such a comb signal, save the fixed band-pass filters 220 and 480, col. 5, lines 33-38, each of which include fixed high- and low-pass filters therein. Therefore, one of ordinary skill in the art could only conclude that the "band" of the comb signals generated, if arguably they could be generated, were only defined

by band-pass filters 220, 480, and perhaps somehow additionally by fixed equalizers 210, 470.

Regarding Maxwell, Applicant notes that the apparatus taught and/or suggested provides only a single signal rapidly *stepped* or otherwise varied *through* the receiver bands, or alternately provides a signal which is difficult to receive in the bands transmitted, or in the further alternative provides a signal if received will be audibly distorted and ineffective in providing the structure and function taught in his patent, discussed more thoroughly in Applicant's prior Amendment, also incorporated here.

By contrast, the present invention according to claim 1, as previously amended, includes:

"a multi-signal generator for simultaneously providing a plurality of signals within a selected frequency band and having a center frequency and relative frequency spacing of said simultaneous plurality of signals, wherein

said center frequency is selectively adjusted to cover at least a portion of the selected frequency band; a modulator connected to said multi-signal generator for selectively and simultaneously modulating said plurality of signals; and

a control unit for selectively controlling at least one of said multi-signal generator center frequency and relative frequency spacing

not found in the cited art of record.

Applicant first argues that Argo is inoperative, or inadequately or confusingly disclosed as the linear mixers 200, 460 cannot provide the comb signals (from the signal inputted) as required by Argo. Secondly, Applicant argues that in view of the multiple cascade of signal generators, filters, mixers, etc. of Argo or Maxwell, it is not obvious at all how or where to add a DDS to or in place of any component in Argo. Thirdly, *arguendo*, if the

'carrier' signals into Argo's mixers 200, 460 were replaced by the DDS of Maxwell, the resulting signal 'band' would not be changed as Argo teaches that the band limits are determined by the respective fixed high- and low-pass filters, 230, 490 and 240, 500 respectively. Moreover, the respective equalizers 210 and 470 ought to somehow (?) be adjusted. Fourthly, as previously argued, the rapid stepping of the signals generated by Maxwell's DDS would render the resulting transmitted signals unreceivable or unintelligible by modern receivers. Fifthly, there is no disclosure on how to change the relative channel spacing as claimed. Thus, it is clearly not obvious, nor is it ever taught, suggested or disclosed how to combine Maxwell into Argo to provide a single functional apparatus, let alone provide the presently claimed invention.

Regarding the rejection of claims 2 and 3, wherein the Examiner asserts that Maxwell's DDS provides said plurality of signals, Applicant notes that the DDS wave in the ROM 204 provides a single frequency only as illustrated in col. 7, lines 13-15, which is serially stepped to another frequency. By contrast, the present claimed invention according to claims 2 and 3 includes "a wave memory for reproducing a selected wave form output signal providing said plurality of signals" not found in the art, either alone or in combination.

Regarding the rejection of claim 4, the Examiner's argument that Maxwell's control unit transfers wave forms to the wave memory is clearly without support as the wave ROM is a "READ-only"

memory, and Fig. 4 shows only an address input. by contrast, the invention according to claim 4 includes a "control unit [which] provides pre-stored wave forms selectively transferred to said wave memory to provide said plurality of signals on a corresponding portion of said selected band" not found in the cited art, alone or in combination.

Regarding the Examiner's rejection of claims 7-9, Applicant again argues that such a combination is not easily possible except by undue experimentation, let alone obvious, to provide an operable apparatus as argued above. Applicant further argues that the confusion of the Examiner's combination is exacerbated by a repeated introduction of Maxwell's DDS into Argo in an undefined manner.

The remaining claims dependent on claim 1 provide additional inventive features to further patentably distinguish the claimed invention over the cited art. Applicant therefore believes that the rejection of claims 1-11 under 35 USC 103(a) as being unpatentable over Argo et al. '978 in view of Maxwell '921 is overcome.

Claims 12-16 were rejected under 35 USC 103(a) as being unpatentable over Argon (and Maxwell?) in view of Wilson '868. With regard to claims 13-16, the Examiner argues that Maxwell shows first and second signal generators having DDS outputs 114 for both the FM and AM band spaced frequencies, the control means 118, the mixer, the power amplifier 132, 162, referring to a plurality of carrier signals from Argo.

Applicant notes that the disclosure of the signal or signal generation from the DDS to the AM modulator on interface 154 is omitted.

By contrast, the invention according to claim 13, as previously amended, includes:

"a first signal generator for simultaneously providing a plurality of carrier signals within a frequency band and having a relative frequency spacing, and including an amplitude modulator of said plurality of said plurality of signals according to a modulation signal;

a second signal generator for selectively providing a selectable frequency signal, and including a frequency modulator of said selectable frequency according to a modulation signal;

a mixer receiving the output signals of said first and second signal generators, and providing an output signal;...

not found in the cited art of record. Applicant first argues that none of the cited art teaches, discloses or suggests said mixer receiving said output signals as both Argo and Maxwell have separate amplifiers and antennas. The switch 209 in Wilson is not literally or equivalent to a switch as claimed. Furthermore, as previously argued, Argo and/or Maxwell, alone or in combination and now Wilson do not teach, suggest or disclose the claimed first signal generator for providing a plurality of carrier signals within a frequency band.

Regarding the rejection of claim 15, none of the cited art alone or in combination provides, teaches or suggests the claimed "...selected portions substantially comprise said frequency band" for the reasons of non-disclosure, non-obviousness and inoperability previously discussed.

Regarding the rejection of claim 16, the claimed invention wherein:

"said first signal generator comprises means for providing a plurality of signals in at least one selected portion of said frequency band according to said control unit, and

said second signal generator provides said selectable frequency signal according to said control unit,

wherein said mixer output signals comprise selected portions which substantially comprise said frequency band...

not found in the cited art as the claimed mixer is not taught, discussed or suggested.

The remaining dependent claims 12, 14 and 17 provides additional inventive features to further patentably distinguish the present invention over the cited art of record. Applicant thus believes that the rejection of claims 12-16 under 35 USC 103(a) as being unpatentable over Argon (and Maxwell?) in view of Wilson '868 is overcome.

Claims 17-20 were rejected under 35 USC 103(a) as being unpatentable over Argo in view of Morris '763. The Examiner argues that Morris provides "a sum of sine wave signals each corresponding to one of the set of carrier frequency, dividing the sum..calculating a variance..changing the phase..repeating.. transmitting..sum of said sine wave signals, for the AM message, AM LO, the FM message, the output 24 AM over FM." The Examiner further argues that it would have been obvious to modify and add Morris' amplitude balancing by adjusting the relative phase, to Argo, such that the modulated signal could control and balance the amplitude of the summed signal. The Examiner refers to Hunsinger '396 for a teaching

of summing into time segment [sic], Fig. 17.

By contrast, the inventive method according to claim 17, comprises the steps of:

- "selecting a set of carrier frequencies;
- providing a corresponding sum of sine wave signals each corresponding to one of the set of carrier frequencies;
- dividing the sum into a number of segments in the time domain;
- calculating a variance of the magnitudes of each said segment;
- changing the phase relationship of said sine wave signals to minimize the variance;
- repeating the steps of calculating and changing until the minimization of the variance from said changes is less than a desired threshold significance value; and
- transmitting a signal corresponding to said sum of said sine wave signals

not found in the cited art of record. The Examiner's argument apparently acknowledges and concedes that Morris does not select a set of carrier frequencies as claimed, but stating that the sine wave signals in the cited art "...each corresponding to one of the set of carrier frequency..." (emphasis added) but do not comprise a set of carrier frequencies as claimed. Furthermore the cited art does not divide the sum into a number of segments in the time domain as claimed, nor calculates a variance of the magnitudes of each said segment as claimed, nor change the phase relationship of said sine wave signals to minimize the variance as claimed, and certainly does not repeat the steps of calculating and changing until the minimization of the variance from said changes is less than a desired threshold significance value, as claimed in claim 17. The cited art merely teaches simple FM and AM modulation (e.g. multiplication) and signal addition, providing no teaching, disclosure or suggestion of the claimed steps as argued, above.

Furthermore, the cited art cannot be modified except by undue experimentation or according to the present Application to provide the method according to claim 17.

Applicant further argues that Morris '763 simply never recites any of "the set of carrier frequency, dividing the sum..calculating a variance.. changing the phase..repeating..transmitting..sum of said sine wave signals, for the AM message, AM LO, the FM message, the output 24 AM over FM". Moreover, Morris is concerned for the generation of single-sideband signal generation without carrier 'breakthrough', thus seeking to reduce the number of carrier signals, not multiply them as claimed. Regarding Hunsinger '396, the summer of the signals provides a *single* baseband signal of multiple data channels, from which the presently claimed invention is instantly and completely patentably distinguishable. Applicant asserts that the cited art does not even mention the steps (e.g. variance, changing the phase) as claimed, let alone do so in a manner which teaches, discloses or suggest the claimed invention alone or in combination. The claims dependent on claim 17, now distinguished from the cited art, provide additional inventive features to further patentably distinguish the present invention over the cited art of record. Applicant therefore believes that the rejection of claims 17-20 under 35 USC 103(a) as being unpatentable over Argo in view of Morris '763 is without support, improper and should be withdrawn, or in the alternative, is overcome.

Claims 21,22 were rejected under 35 USC 103(a) as being unpatentable over Argo in view of Hunsinger et al '396. The Examiner argues that Hunsinger claim 21 teaches modulating said signal corresponding to the sum of said sine wave signals, etc. and front figure, abstract, col. 9, lines 54-58 teach simultaneous transmission of AM over FM to the broadcast band using the sum 22 for generating the composite AM over FM signal.


The claimed step of "modulating said signal corresponding to the sum of said sine wave signals" is not taught, discussed or suggested. The entire essence of Hunsinger is to be "in band" and "on channel" meaning a single broadcast band channel. Applicant asserts that the rejection is improper, without support and must be withdrawn. Furthermore, the claims dependent on claim 17 provide additional inventive features to further patentably distinguish the present invention over the cited art of record. Therefore, Applicant believes that the rejection of claims 17-20 under 35 USC 103(a) as being unpatentable over Maxwell in view of Morris '763 (or Hunsinger et al., '396) is improper and without support and should be withdrawn, or in the alternative, is overcome.

Claims 21-22 were rejected under 35 USC 103(a) as being unpatentable over Maxwell in view of Argo et al., and further in view of Hunsinger et al., '396. Applicant argues that the additionally claimed inventive steps or their equivalent are clearly not present in the cited art of record. The Examiner's reference to mere AM or FM modulation of single FM and AM carrier signals cannot be said to be the claimed operation on the set of

carrier frequencies as claimed. Therefore Applicant believes that the rejection of claims 21-22 under 35 USC 103(a) as being unpatentable over Argo et al. in view of Hunsinger et al., '396 is improper and should be withdrawn, or in the alternative, is overcome.

Applicant, having amended the claims and having overcome the rejections to the present patent Application, believes that the present application is in condition for allowance. Applicant respectfully requests reconsideration and allowance of the present application. The Examiner is invited to call the Applicant's undersigned attorney should he feel that such a call would further the prosecution of the present application.

Respectfully submitted,
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